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Hi-tech takes weighty ships through shallows

ANNE-LOUISE BROWN
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Australian technology is adapting to growing ship-load sizes and the need for safety, and making it possible to save billions of dollars in port maintenance.

OMC International, founded by engineer Dr Terry O'Brien in 1987, is a leader in the development of under-keel clearance software technology.

O'Brien launched his Dynamic Under Keel Clearance (DUKC) system in 1993 after leaving academia to run a one-man shipping consultancy. OMC International, which is Melbourne-based, now employs more than 60 people and continues to grow as the technology is adopted across the world.

"The idea of the DUKC is to accurately and scientifically calculate the exact amount of clearance large ships need under the keel when they're moving along shallow entrance channels into and out of ports," O'Brien says.

"We've been able to make significant production increases in the carrying capacity of ships into and out of ports, which has resulted in many billions of dollars of additional saving to shippers."

DUKC's safety record speaks for itself — at the 24 ports it operates within worldwide it is reported there has not been a single safety

incident in 25 years. It is currently in use throughout Australia, New Zealand, Canada, Portugal and Germany, and the company is negotiating with other countries.

O'Brien recognised the need for the system after being asked by numerous shippers about the motion of ships travelling down channels.

"There was no scientific rationale in place, just an old rule that said allow 10 per cent of space under the keel," he says.

"I developed the technology in real-time, using science to pinpoint the ideal time for a ship of a certain size carrying a certain load to travel down a channel.

"It's based on computer modelling taking into account weather forecasting, water levels, waves sizes and currents. This is especially useful in the Southern Hemisphere where we have massive wave conditions because of the expanse of ocean.

"Our technology has continued to develop in line with other technological developments and we tend to stay ahead of the pack."

Currently, more than 95 per cent of Australia's iron ore exports and 75 per cent of coal exports leave the country through ports using the DUKC system.

O'Brien described the company's partnership with the Pilbara Ports Authority as its most "spectacular achievement".

DUKC controls the movements of ships in and out of Port Hedland, the world's largest bulk export port. Large tidal range experienced in Port Hedland together with the long channel length, make it necessary to carefully manage vessel sailing drafts.

The DUKC was introduced into Port Hedland, in Western Australia, in 1996 to benefit shippers, ship owners and charterers through maximising the sailing draft and extending the tidal sailing windows. Vessels can ship greater tonnages without compromising vessel or port safety.

In addition to increasing load capacity and improving safety, the DUKC has helped ports save millions in dredging costs. This is because it can identify trouble spots so targeted dredging can be carried out.

"Where installed, DUKC system can increase port capacity with less capital dredging because it can create the channel depth profile which matches the depths required for the ships transiting," O'Brien says. "This maximises the value of every centimetre dredged while minimising harm to the marine ecosystem." ■